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Washington, D.C. 20231

Docket No. 30875

Date October 20, 2000

Transmitted herewith for filing under 35 U.S.C. 111 and 37. C.F.R. 1.53 is the patent application of:

INVENTOR(S): ERIC RONNING

FOR: METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES AND INFORMATION TO PERSONAL COMPUTING DEVICES

Enclosed are:

X Certificate of Mailing with Express Mail Mailing Label No. EL618532672US

X 1 sheets of drawing(s)

X Combined Declaration and Power of Attorney

X An Assignment of the invention to HANDSIGNAL, INC. together with the recording fee of \$40.00.

X A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.

## Information Disclosure Statement

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE		
TOTAL CLAIMS	16-20=	* 0
INDEP. CLAIMS	2-3=	* 0
MULTIPLE DEPENDENT CLAIM PRESENT		

\*If the difference in col. 1 is less than zero, enter "0" in Col. 2

SMALL ENTITY

RATE	FEE
	\$ 355.00
x 9	
x 40	
+135	
TOTAL	\$ 355.00

TOTAL

\$ 355.00

OTHER THAN A  
SMALL ENTITY

OR	RATE	FEE
OR		\$ 710.00
OR	x 18	
OR	x 80	
OR	+270	
OR	TOTAL	\$

OR

TOTAL

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Please charge my Deposit Account No. 19-0522 in the amount of \$ \_\_\_\_\_. A duplicate of this sheet is enclosed.

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X Any additional filing fees required under 37 CFR 1.16.

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X Any patent application processing fees under 37 CFR 1.16.

The issue fee set in 37 CFR 1.18 at or before the mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(f).

X Any fees under 37 CFR 1.16 for presentation of extra claims.

By

Thomas B. Luebbering, Reg. No. 37,874



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PATENT TRADEMARK OFFICE

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CERTIFICATION UNDER 37 C.F.R. 1.10



Enclosed for filing is the application for United States Letters Patent of ERIC RONNING, Attorney Docket No. 30875, entitled METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES AND INFORMATION TO PERSONAL COMPUTING DEVICES, including: **Transmittal, Specification, Claims, Abstract, 1 sheet formal drawings, Combined Declaration and Power of Attorney, Small Entity Statement, \$355.00 filing fee, Assignment Cover Sheet, Assignment, \$40.00 recordation fee, and return card.**

EL618532672US

"Express Mail" mailing number

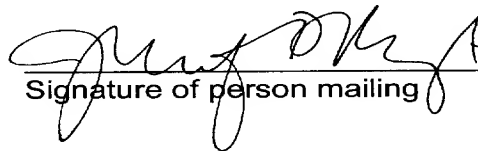
October 20, 2000

Date of Deposit

I hereby certify that the above-noted papers are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to BOX NEW APPLICATION, Assistant Commissioner for Patents, Washington, DC 20231.

Jen Krygiel

Name of person mailing



Signature of person mailing

SCANNED, # 14

Applicant or Patentee: ERIC RONNING

Attorney's Docket No. 30875

Serial or Patent No.:

Filed or Issued:

For: METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES AND INFORMATION TO PERSONAL COMPUTING DEVICES

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) AND 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

☐ ]

the owner of the small business concern identified below:

☒ ]

an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN HandSignal, Inc.

ADDRESS OF CONCERN 4324 W. 87th Street, Prairie Village, KS 66207

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES AND INFORMATION TO PERSONAL COMPUTING DEVICES by inventor(s) ERIC RONNING, described in

☒ ] the specification filed herewith.

☐ ] application serial no. , filed .

☐ ] patent no. , issued .

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ ] INDIVIDUAL ☐ ] SMALL BUSINESS CONCERN ☐ ] NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ ] INDIVIDUAL ☐ ] SMALL BUSINESS CONCERN ☐ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Eric Ronning

TITLE OF PERSON OTHER THAN OWNER President

ADDRESS OF PERSON SIGNING 4324 W. 87th Street, Prairie Village, KS 66207

SIGNATURE

*Eric Ronning*

DATE

Oct 20, 2010

METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES  
AND INFORMATION TO PERSONAL COMPUTING DEVICES

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BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to wireless communications. More particularly, the invention relates to a method and system for automatically pushing  
10 wireless messages and other information to personal computing and communication devices such as personal digital assistants.

2. DESCRIPTION OF THE PRIOR ART

The market for wireless communication services has grown dramatically  
15 in the past few years and is expected to grow at an even faster rate in the future. Many experts predict that wireless communication services will soon surpass traditional "wired" methods of communication. Wireless communication services are no longer limited to voice traffic, but instead now include voice and data traffic so that all types of messages and information can be wirelessly transmitted to and from mobile devices.

20 Unfortunately, current wireless communication services, as well as conventional wired communication services such as e-mail, voice mail, telephone services, etc., require users to connect to a provider by dialing-in and/or accessing a network before information can be retrieved. This is a problem because users often cannot regularly check for new messages and information and therefore often retrieve  
25 time-sensitive information too late.

The above-described problem has been partially remedied by wireless communication services that automatically "push" information to users rather than requiring the users to "pull" the information from a provider. However, such push communication services still require the users to be connected to a service provider to  
30 be able to use and act upon the information. Once the users go off-network or off-line, the information cannot be used and/or acted upon. Moreover, existing push types of communication services can only push short messages and are therefore not robust enough for many business applications that require more extensive messages and data to be pushed to users.

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## SUMMARY OF THE INVENTION

The present invention solves the above-described problems and provides a distinct advance in the art of communication methods. More particularly, the present invention provides a method and system for pushing information to personal computing and communication devices operated by users in such a way that the users can use and/or act upon the information even when the users are off-network or off-line. The present invention also provides a method and system for automatically "provisioning" personal computing and communication devices so that the devices may be used to act upon the information that is pushed to the devices.

One preferred embodiment of the present invention is implemented with a computer network that is coupled with at least one wireless communication service provider. The computer network is operated by an administrator or provider that offers push message and information delivery services in accordance with the present invention. Senders of messages and other information may access the computer network and provide information destined for a recipient. The computer network then conditions the information and stores the information in a queue until a computing and communication device operated by the recipient is in communication with a corresponding wireless communication service provider. The computer network then automatically pushes the information to the device once it is in communication with the service provider and automatically loads the information into appropriate databases and/or programs in the device. The device thus receives necessary information without requiring the recipient to request the information or to enter or load the information into the appropriate program or database residing on the device.

The computer network may also provision devices by automatically loading and assembling software applications in the devices wirelessly without input or configuration from users of the device. For example, in one embodiment of the invention, the computer network may push information to a device operated by a recipient as described above. The device may then determine that it does not have the necessary applications and/or software versions to process the information and thus automatically transmits a wireless message back to the computer network with an indication of what applications and/or software versions need to be sent to the device. The computer network then automatically pushes any additional necessary software to the device. This allows all information and necessary programs to be seamlessly

pushed to a device without requiring the user of the device to determine which programs are necessary to run the information, request the information, or to load the information and programs into the device.

These and other important aspects of the present invention are described  
5 more fully in the detailed description below.

## BRIEF DESCRIPTION OF THE DRAWING FIGURES

A preferred embodiment of the present invention is described in detail below with reference to the attached drawing figures, wherein:

10 Fig. 1 is a schematic diagram depicting computer and communications equipment that may be used to implement certain aspects of the present invention.

Fig. 2 is a schematic diagram depicting certain of the components of Fig. 1 in more detail.

15 The drawing figures do not limit the present invention to the specific embodiments disclosed and described herein. The drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 The present invention can be implemented in hardware, software, firmware, or a combination thereof. In a preferred embodiment, however, the invention is implemented with one or more computer programs that operate computer and communications equipment broadly referred to by the numeral 10 in Fig. 1. The computer and communications equipment 10 includes a computer network 12, a  
25 computer network 14, a wireless communication service provider network 16, and a plurality of computer and communication devices 18. The computer program and equipment 10 illustrated and described herein are merely examples of programs and equipment that may be used to implement preferred embodiments of the present invention and may be replaced with other software and computer equipment without  
30 departing from the scope of the present invention.

The computer network 12 is preferably operated by an administrator or provider of the services of the present invention and may include a variety of different conventional computing equipment. In one preferred embodiment of the present

invention illustrated in Fig. 2, the computer network includes a server gateway computer 20, a web server computer 22, and a communications server 24. Each of the computers 20, 22, 24 may be any computing device such as a network computer running Windows NT, Novell Netware, Unix, or any other network operating system. The computers are preferably coupled to one another and to other equipment such as various databases 26 and computers or terminals 28 by a wireless area network 30 or other conventional network. The web server computer 22 may also be coupled with a hub 32, a firewall 34, another hub 36, and a router 38. The web server computer 22 also includes conventional web hosting operating software, an Internet connection such as a modem, DSL converter or ISDN converter, and is assigned a URL and corresponding domain name so that the web server computer can be accessed via the Internet in a conventional manner.

The computer network 14 represents any number of computer systems that may be operated by persons or entities wishing to send messages and other information to recipients and may include any types of conventional computer equipment. In one preferred embodiment, each computer network 14 is coupled with the computer network 12 via a frame relay or VPN connection 40 and includes one or more server computers 42 and one or more personal computers 44 that may access the server computer 42 via a communications network 46 such as the Internet. In another embodiment of the invention, senders of messages and other information may also access the web server computer 22 of the computer network 12 with one or more personal computers 48 via the Internet 50.

The wireless communications network 16 represents any number of conventional wireless communication provider networks such as PCS, ReFLEX, Advanced Radio Data Network and cellular networks that may be used to implement certain steps of the present invention. Each wireless network includes various computing equipment broadly referred to by the numeral 52 and a plurality of broadcast antennas 54 that serve different cells or coverage areas.

The computing and communication devices 18 are operated by recipients of messages and other information and preferably are handheld personal digital assistants such as those manufactured and sold by Palm, Handspring, RIM, Symbol, and Kyocera. The computing and communication devices 18 may also be personal or laptop computers such as those manufactured and sold by Dell, Compaq, Gateway, or

any other computer manufacturer; intelligent mobile phones; pagers; or even Internet appliances that are specifically designed for accessing the Internet. Each computing device 14 includes wireless communications capabilities so that it can send and receive wireless messages and other information.

5           The computer programs of the present invention are stored in or on computer-readable medium residing on or accessible by the computer network 12 and the devices 18 for instructing the equipment to operate as described herein. Each computer program preferably comprises an ordered listing of executable instructions for implementing logical functions in the computer network 12 and the devices 18. The  
10 computer programs can be embodied in any computer-readable medium for use by or in connection with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device, and execute the instructions. In the context of this application, a "computer-readable medium" can  
15 be any means that can contain, store, communicate, propagate or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer-readable medium can be, for example, but not limited to, an electronic, magnetic, optical, electro-magnetic, infrared, or semi-conductor system, apparatus, device, or propagation medium. More specific, although not inclusive, examples of the  
20 computer-readable medium would include the following: an electrical connection having one or more wires, a portable computer diskette, a random access memory (RAM), a read-only memory (ROM), an erasable, programmable, read-only memory (EPROM or Flash memory), an optical fiber, and a portable compact disk read-only memory (CDROM). The computer-readable medium could even be paper or another suitable  
25 medium upon which the program is printed, as the program can be electronically captured, via for instance, optical scanning of the paper or other medium, then compiled, interpreted, or otherwise processed in a suitable manner, if necessary, and then stored in a computer memory.

          The computer programs of the present invention preferably include  
30 communication and provisioning programs residing on the computer network 12 and communication and provisioning programs as well as custom application programs, form applications, or other interpretive programs residing on each of the devices 18. The functionality and operation of several preferred implementations of these programs are



described in more detail below. In this regard, some of the steps discussed below may represent a module segment or portion of code of the computer programs of the present invention which comprises one or more executable instructions for implementing the specified logical function or functions. In some alternative implementations, the functions described may occur out of the order described. For example, two functions described as being in succession may in fact be executed substantially concurrently, or the functions may sometimes be executed in the reverse order depending upon the functionality involved.

In one application of the present invention, the above-described computer and communications equipment 10 and computer programs are used to automatically push dispatch-type information from senders to recipients, request acknowledgment from the recipients, and then transmit task status information from the recipients back to the computer network 12 for delivery to the senders. The senders of the information may include companies such as trucking companies or service companies, and the recipients may include workers of the companies such as truck operators, electricians, plumbers, technicians, or computer service personnel. As used herein, the term "information" is meant to include all types of messages, data, programs, applications, and other information that senders may wish to send to recipients, or vice versa.

A sender that wishes to push information to a recipient first accesses the computer network 12 via one of the computer networks 14 or computers 48 and submits dispatch information to the computer network 12. The dispatch information may include, for example, information relating to a maintenance activity, a load pick-up, a load delivery, or other type of project. Such information may also include task lists, punch lists, parts lists, the address for a pick-up or project start point, the address for a drop-off or project stop point, a date and time for the requested pick-up or drop-off, detailed instructions relating to the tasks to be performed, and other related information. This information may be generated with an Internet-based dispatch application and may involve the use of a database that contains attributes for tracking status information related to the task (i.e. accepted, declined, arrived, finished).

Once the sender submits the above dispatch information to the computer network 12, the computer network 12 conditions or processes the information so that it may be delivered to the intended recipient. The computer network 12 does so by first creating a unique message ID number for the information that is to be sent. The

computer network 12 then records the information in a recovery log using the message ID so that it may be later recovered. The information is then moved to a queue in the computer network 12 and stored based on the message type and assigned certain tracking information such as a process code, a format code, and a version number.

5           The computer network 12 may at this point convert the information to transmittable strings in a compressed, binary, or encrypted mode. The information is then parsed into a series of message packets and then moved to a packet queue. The message packets are next sent from the packet queue to a communication thread of a wireless communication service provider 16 which serves the device 18 for which the  
10 information is destined. When the provider 16 acknowledges receipt of the message packets, the computer network 12 updates the status of the information in the recovery log. A record for the information is then moved to a transaction log for record-keeping purposes. Finally, the message packets are delivered to a queue operated by the wireless service provider 16.

15           The wireless service provider 16 then delivers the message packets to the nearest transmission tower 54 according to the last known position of the device 18 as listed in a home location register (HLR) or visiting location register (VLR) accessible by the provider. Once the device 18 is in range and in communication with the wireless service provider, the message packets are broadcast to the device in a conventional  
20 manner.

          A communication layer on the device 18 receives and stores the message packets in a packet queue, turns on the device, and activates a communication program residing on the device 18 and configured in accordance with one aspect of the present invention. The communication program processes the message packets by stripping the  
25 header from each packet, concatenating the packets in sequence order, converting the strings of information from transmittable strings to the appropriate format for the program or application that will access or run the information (i.e. compressed, binary, or encrypted mode), and inserting the message number, message description, message category, and date into a message manager database. The communication program 18  
30 also runs error tests to ensure integrity of the information, and deletes the packets from the packet queue if the information was received error-free. The communication program then automatically loads the information into the appropriate program or

application residing on the device 18 so that the information can be acted upon by the user of the device 18.

A custom dispatch application on the device 18 then receives the message string from the communication program, sounds an alert if the information is marked as urgent, and displays the dispatch information so that the user of the device 18 may accept, decline, or otherwise comment on the dispatch information. Once the recipient accepts or declines, the dispatch application composes an automatic feedback message that is to be transmitted to the computer network 12. The feedback message is then passed to the communication program residing on the device 18.

The communication program residing on the device 18 then processes the feedback message by assigning a message key to the message (if needed), counting the characters in the message, and determining the number of packets required to transmit it. Configuration parameters pertinent to the device 18, the wireless service provider 16, and the computer network 12 are stored on the device 18 in a configuration file to determine optimal packet sizes. The communication program then builds packet headers from the message number and packet sequence numbers and splits the message into a number of packets. The packet headers are then concatenated onto the front of each packet, and the packets are moved to an outgoing queue.

The communication layer on the device 18 then receives and stores the message packets and prepares the device 18 to transmit the packets. The packets are transmitted from the device 18 to the nearest tower 54, which then confirms receipt of the packets. Specifically, the wireless service provider 16 receives the message packets, recognizes the packet identifier and/or address, acknowledges receipt, and moves the message packets to a corresponding queue residing in the computer network 12.

The computer network 12 next processes the incoming feedback message by creating a unique message ID number if the message does not have an existing message ID and then recording the message packets with the message ID in the recovery log. The message packets are then moved to a queue based on the message type. These packets are processed by removing packet headers and concatenating into a single message string in sequence order. The message string is then converted from transmittable characters into appropriate compressed, binary, or encrypted strings. The status of the message in the log is then updated. Finally, the message record is moved

to a transaction log for record-keeping and the message string is transmitted to a queue on the sender's computer equipment 14 or 48.

The sender's computer equipment 14 or 48 receives the message from the computer network 12 and acknowledges acceptance. The information is then stored as a record in a task status database associated with the dispatch assignment. Dispatchers may then access the task status database to evaluate which tasks have been assigned, accepted, or declined.

In another application of the present invention, the above-described computer and communications equipment 10 and computer programs are used to automatically provision the devices 18 by sending software upgrades, new applications or programs, or other large binary objects to the devices 18. This allows users of the devices 18 to act upon information that is pushed to the devices 18 even if the devices 18 do not have all necessary applications and/or software.

For example, in one embodiment of the invention, the computer network may push information to a device operated by a recipient as described above. The device may then determine from the information what applications and/or software is needed to act upon the information. The device then automatically generates and transmits a wireless message back to the computer network with an indication of what applications and/or software are needed. The computer network then automatically pushes any necessary software to the device. This allows all information and necessary programs to be seamlessly pushed to a device without requiring the user of the device to determine which programs are necessary to run the information, request the information, or load the information and programs into the device.

For this application, the computer network 12 includes a library that can be populated with various binary objects such as the software upgrades, applications, and other items discussed above. This library also preferably includes a distribution list that lists all recipients that have received each object, a description of each object, a final assembled size of each object, a check sum benchmark to confirm that each object has been assembled in the correct sequence, and a binary copy of each object. Attributes for tracking which recipients have acknowledged receipt of an object may also be stored in or alongside the library.

An object that is to be sent to a device 18 is first passed to the gateway computer 20. The gateway computer 20 then conditions or processes the object so that

it may be more easily delivered to the intended recipient. The computer network 12 does so by first creating a unique message ID number for the object. The computer network 12 then records the object in a recovery log using the message ID so that it may be later recovered. The object is then moved to a queue in the computer network 12 and stored  
5 based on the message type and assigned certain tracking information such as a process code, a format code, and a version number.

The computer network 12 may at this point convert the object to transmittable strings in a compressed, binary, or encrypted mode. The object is then parsed into a series of message packets and then moved to a packet queue. The  
10 message packets are next sent from the packet queue to a communication thread of a wireless communication service provider 16 which serves the device 18 for which the object is destined. When the provider 16 acknowledges receipt of the message packets, the computer network 12 updates the status of the information in the recovery log. A record for the object is then moved to a transaction log for record-keeping purposes.  
15 Finally, the message packets are delivered to a queue operated by the wireless service provider 16.

The wireless service provider 16 then delivers the message packets to the nearest transmission tower 54 according to the last known position of the device 18 as listed in an HLR or VLR. Once the device 18 is in range and in communication with the  
20 wireless service provider, the message packets are broadcast to the device in a conventional manner.

A communication layer on the device 18 receives and stores the message packets in a packet queue, turns on the device, and activates a communication program residing on the device 18 and configured in accordance with one aspect of the present  
25 invention. The communication program processes the message packets by stripping the header from each packet, concatenating the packets in sequence order, converting the strings of information from transmittable strings to the appropriate format for the object, and inserting the message number, message description, message category, and date into a message manager database. The communication program 18 also runs error  
30 tests to ensure integrity of the object, and deletes the packets from the packet queue if the object was received error-free.

The communication program passes the assembled object to a provisioning program residing on the device 18. The provisioning program then loads

the object string from the communication program and proceeds to assemble and test the object based on certain header information including the check sum for the assembled object, the size of the assembled object, and the creator ID assigned to the object. Once the object has been assembled and confirmed, the provisioning program  
5 installs the object on the device and creates a feedback message indicating that the installation has been successful. The feedback message is then transferred to the communication program residing on the device 18.

The communication program processes the feedback message by assigning a message key to the message (if needed), counting the characters in the  
10 message, and determining the number of packets required to transmit it. Configuration parameters pertinent to the device 18, the wireless service provider 16, and the computer network 12 are stored on the device 18 in a configuration file to determine optimal packet sizes. The communication program then builds packet headers from the message number and packet sequence numbers and splits the message into a number  
15 of packets. The packet headers are then concatenated onto the front of each packet, and the packets are moved to an outgoing queue.

The communication layer then receives and stores the message packets and prepares the device 18 to transmit the packets. The packets are transmitted from the device 18 to the nearest tower 54, which then confirms receipt of the packets.  
20 Specifically, the wireless service provider 16 receives the message packets, recognizes the packet identifier and/or address, acknowledges receipt, and moves the message packets to a corresponding queue residing in the computer network 12.

The computer network 12 next processes the incoming feedback message by creating a unique message ID number if the message does not have an existing  
25 message ID and then recording the message packets with the message ID in the recovery log. The message packets are then moved to a queue based on the message type and then concatenated into a single message string. The message string is then converted from transmittable characters into appropriate compressed, binary, or encrypted strings. The status of the message in the log is then updated. Finally, the  
30 message record is moved to a transaction log for record-keeping and the message string is transmitted to a queue on the sender's computer equipment 14 or 48.

The sender's computer equipment 14 or 48 receives the message from the computer network 12 and acknowledges receipt. Administrators may then access the

computer network 12 and see which recipients have received a new object by viewing web pages that access records in the computer network 12.

In another application of the present invention, the above-described computer and communications equipment 10 and computer programs may be used to automatically push calendar information to the devices 18. The calendar information may include, for example, meeting dates, travel schedules, deadlines, etc.

A sender that wishes to push such calendar information to a recipient first accesses the computer network 12 via one of the computer networks 14 or computers 48 and submits the information to the computer network 12. The computer network 12 then conditions or processes the information so that it may be delivered to the intended recipient. The computer network 12 does so by first creating a unique message ID number for the information. The computer network 12 then records the information in a recovery log using the message ID so that it may be later recovered. The information is then moved to a queue in the computer network 12 and stored based on the message type and assigned certain tracking information such as a process code, a format code, and a version number.

The computer network 12 may at this point convert the information to transmittable strings in a compressed, binary, or encrypted mode. The information is then parsed into a series of message packets and then moved to a packet queue. The message packets are next sent from the packet queue to a communication thread of a wireless communication service provider 16 which serves the device 18 for which the information is destined. When the provider 16 acknowledges receipt of the message packets, the computer network 12 updates the status of the information in the recovery log. A record for the information is then moved to a transaction log for record-keeping purposes. Finally, the message packets are delivered to a queue operated by the wireless service provider 16.

The wireless service provider 16 then delivers the message packets to the nearest transmission tower 54 according to the last known position of the device 18 as listed in an HLR or VLR. Once the device 18 is in range and in communication with the wireless service provider, the message packets are broadcast to the device in a conventional manner.

A communication layer on the device 18 receives and stores the message packets in a packet queue, turns on the device, and activates a communication program

residing on the device 18 and configured in accordance with one aspect of the present invention. The communication program processes the message packets by stripping the header from each packet, concatenating the packets in sequence order, converting the strings of information from transmittable strings to the appropriate format for the program or application that will access or run the information (i.e. compressed, binary, or encrypted mode), and inserting the message number, message description, message category, and date into a message manager database. The communication program 18 also runs error tests to ensure integrity of the information, and deletes the packets from the packet queue if the information was received error-free. The communication program then automatically loads the information into the appropriate program or application residing on the device 18 so that the information can be acted upon by the user of the device 18.

A custom calender or scheduling application on the device 18 then receives the message string from the communication program, sounds an alert if the information is marked as urgent, and displays the information so that the user of the device 18 may act upon it. The user may, for example, review proposed meeting dates and times and either accept or decline the proposed times or press a button labeled "Later." Pressing the Later button causes the display screen to delay requesting this information until the next time the device is turned on. If the recipient accepts or declines, the calender application adds the event to a scheduling program and composes an automatic feedback message that is to be transmitted to the computer network 12. The feedback message is then passed to the communication program residing on the device 18.

The communication program residing on the device 18 then processes the feedback message by assigning a message key to the message (if needed), counting the characters in the message, and determining the number of packets required to transmit it. Configuration parameters pertinent to the device 18, the wireless service provider 16, and the computer network 12 are stored on the device 18 in a configuration file to determine optimal packet sizes. The communication program then builds packet headers from the message number and packet sequence numbers and splits the message into a number of packets. The packet headers are then concatenated onto the front of each packet, and the packets are moved to an outgoing queue.



The communication layer on the device 18 then receives and stores the message packets and prepares the device 18 to transmit the packets. The packets are transmitted from the device 18 to the nearest tower 54, which then confirms receipt of the packets. Specifically, the wireless service provider 16 receives the message packets, recognizes the packet identifier and/or address, acknowledges receipt, and moves the message packets to a corresponding queue residing in the computer network 12.

The computer network 12 next processes the incoming feedback message by creating a unique message ID number if the message does not have an existing message ID and then recording the message packets with the message ID in the recovery log. The message packets are then moved to a queue based on the message type and then concatenated into a single message string. The message string is then converted from transmittable characters into appropriate compressed, binary, or encrypted strings. The status of the message in the log is then updated. Finally, the message record is moved to a transaction log for record-keeping and the message string is transmitted to a queue on the sender's computer equipment 14 or 48.

A scheduling program on the sender's computer equipment 14 or 48 receives the message from the computer network 12 and acknowledges acceptance of the proposed meeting or other event. The information is then stored as a record in a calendaring database. Administrators can then access the calendaring database to see which recipients have accepted the proposed meeting date.

In another application of the present invention, the above-described computer and communications equipment 10 and computer programs may be used to automatically send to one or more of the devices 18 a request for data matching a particular criteria. The device then fills the request and sends the results back to the computer network 12 for delivery to the requestor of the data.

A sender that wishes to request such a data search first accesses the computer network 12 via one of the computer networks 14 or computers 48 and identifies the search criteria and the devices to be searched. The search criteria may be generated with any known data search program or application.

Once the sender submits the above search information to the computer network 12, the computer network 12 conditions or processes the information so that it may be delivered to the intended recipient. The computer network 12 does so by first

creating a unique message ID number for the information that is to be sent. The computer network 12 then records the information in a recovery log using the message ID so that it may be later recovered. The information is then moved to a queue in the computer network 12 and stored based on the message type and assigned certain tracking information such as a process code, a format code, and a version number.

The computer network 12 may at this point convert the information to transmittable strings in a compressed, binary, or encrypted mode. The information is then parsed into a series of message packets and then moved to a packet queue. The message packets are next sent from the packet queue to a communication thread of a wireless communication service provider 16 which serves the device 18 for which the information is destined. When the provider 16 acknowledges receipt of the message packets, the computer network 12 updates the status of the information in the recovery log. A record for the information is then moved to a transaction log for record-keeping purposes. Finally, the message packets are delivered to a queue operated by the wireless service provider 16.

The wireless service provider 16 then delivers the message packets to the nearest transmission tower 54 according to the last known position of the device 18 as listed in an HLR or VLR. Once the device 18 is in range and in communication with the wireless service provider, the message packets are broadcast to the device in a conventional manner.

A communication layer on the device 18 receives and stores the message packets in a packet queue, turns on the device, and activates a communication program residing on the device 18 and configured in accordance with one aspect of the present invention. The communication program processes the message packets by stripping the header from each packet, concatenating the packets in sequence order, converting the strings of information from transmittable strings to the appropriate format for the program or application that will access or run the information (i.e. compressed, binary, or encrypted mode), and inserting the message number, message description, message category, and date into a message manager database. The communication program 18 also runs error tests to ensure integrity of the information, and deletes the packets from the packet queue if the information was received error-free. The communication program then automatically loads the information into a custom search application

residing on the device 18 so that the information can be acted upon by the user of the device 18.

The custom search application on the device 18 then receives the message string from the communication program and initiates a series of find operations on the device to locate all records matching the search criteria. Once the records have been identified, the results are collected and formatted to be transmitted to the computer network 12. The results are then passed to the communication program residing on the device 18.

The communication program then processes the results by assigning a message key to the message (if needed), counting the characters in the message, and determining the number of packets required to transmit it. Configuration parameters pertinent to the device 18, the wireless service provider 16, and the computer network 12 are stored on the device 18 in a configuration file to determine optimal packet sizes. The communication program then builds packet headers from the message number and packet sequence numbers and splits the message into a number of packets. The packet headers are then concatenated onto the front of each packet, and the packets are moved to an outgoing queue.

The communication layer on the device 18 then receives and stores the message packets and prepares the device 18 to transmit the packets. The packets are transmitted from the device 18 to the nearest tower 54, which then confirms receipt of the packets. Specifically, the wireless service provider 16 receives the message packets, recognizes the packet identifier and/or address, acknowledges receipt, and moves the message packets to a corresponding queue residing in the computer network 12.

The computer network 12 next processes the incoming results by creating a unique message ID number if the message does not have an existing message ID and then recording the message packets with the message ID in the recovery log. The message packets are then moved to a queue based on the message type and then concatenated into a single message string. The message string is then converted from transmittable characters into appropriate compressed, binary, or encrypted strings. The status of the message in the log is then updated. Finally, the message record is moved to a transaction log for record-keeping and the message string is transmitted to a queue on the sender's computer equipment 14 or 48.

The sender's computer equipment 14 or 48 receives the results from the computer network 12 and acknowledges acceptance. An information requestor may then access the results to determine what records or data were found that meet the criteria. Alternatively, the above-described data search can be initiated by one of the devices 18 and the results can be sent to the requesting device.

In another application of the present invention, the above-described computer and communications equipment 10 and computer programs may be used to automatically request location information from multiples devices 18 and determine which device 18 is closest to a particular location. Such information may be used for dispatching mobile units to assignments based on location information for the mobile units.

A sender that wishes to push location information to a recipient first accesses the computer network 12 via one of the computer networks 14 or computers 48 and submits such information to the computer network 12. The location information may be generated with any known dispatch application and may also include project information such as an address for a project and a scheduled date and time. The location information requested from the devices 18 is preferably GPS location coordinates generated from GPS receivers located on the devices 18.

Once the sender submits the above location information to the computer network 12, the computer network 12 conditions or processes the information so that it may be delivered to the intended recipient. The computer network 12 does so by first creating a unique message ID number for the information that is to be sent. The computer network 12 then records the information in a recovery log using the message ID so that it may be later recovered. The information is then moved to a queue in the computer network 12 and stored based on the message type and assigned certain tracking information such as a process code, a format code, and a version number.

The computer network 12 may at this point convert the information to transmittable strings in a compressed, binary, or encrypted mode. The information is then parsed into a series of message packets and then moved to a packet queue. The message packets are next sent from the packet queue to a communication thread of a wireless communication service provider 16 which serves the device 18 for which the information is destined. When the provider 16 acknowledges receipt of the message packets, the computer network 12 updates the status of the information in the recovery

log. A record for the information is then moved to a transaction log for record-keeping purposes. Finally, the message packets are delivered to a queue operated by the wireless service provider 16.

The wireless service provider 16 then delivers the message packets to the nearest transmission tower 54 according to the last known position of the device 18 as listed in an HLR or VLR. Once the device 18 is in range and in communication with the wireless service provider, the message packets are broadcast to the device in a conventional manner.

A communication layer on the device 18 receives and stores the message packets in a packet queue, turns on the device, and activates a communication program residing on the device 18 and configured in accordance with one aspect of the present invention. The communication program processes the message packets by stripping the header from each packet, concatenating the packets in sequence order, converting the strings of information from transmittable strings to the appropriate format for the program or application that will access or run the information (i.e. compressed, binary, or encrypted mode), and inserting the message number, message description, message category, and date into a message manager database. The communication program 18 also runs error tests to ensure integrity of the information, and deletes the packets from the packet queue if the information was received error-free. The communication program then automatically loads the information into the appropriate program or application residing on the device 18 so that the information can be acted upon by the device 18.

A custom location application on the device 18 then receives the message string from the communication program. The location application then polls a GPS receiver on or coupled with the device 18 through a location communication port. The GPS receiver provides response by providing GPS coordinate readings. The location application formats the GPS coordinates into an automatic feedback message to be sent back to the computer network 12. The feedback message is then passed to the communication program residing on the device 18.

The communication program residing on the device 18 then processes the feedback message by assigning a message key to the message (if needed), counting the characters in the message, and determining the number of packets required to transmit it. Configuration parameters pertinent to the device 18, the wireless service

provider 16, and the computer network 12 are stored on the device 18 in a configuration file to determine optimal packet sizes. The communication program then builds packet headers from the message number and packet sequence numbers and splits the message into a number of packets. The packet headers are then concatenated onto the front of each packet, and the packets are moved to an outgoing queue.

The communication layer on the device 18 then receives and stores the message packets and prepares the device 18 to transmit the packets. The packets are transmitted from the device 18 to the nearest tower 54, which then confirms receipt of the packets. Specifically, the wireless service provider 16 receives the message packets, recognizes the packet identifier and/or address, acknowledges receipt, and moves the message packets to a corresponding queue residing in the computer network 12.

The computer network 12 next processes the incoming feedback message by creating a unique message ID number if the message does not have an existing message ID and then recording the message packets with the message ID in the recovery log. The message packets are then moved to a queue based on the message type and then concatenated into a single message string. The message string is then converted from transmittable characters into appropriate compressed, binary, or encrypted strings. The status of the message in the log is then updated. Finally, the message record is moved to a transaction log for record-keeping and the message string is transmitted to a queue on the sender's computer equipment 14 or 48.

The sender's computer equipment 14 or 48 receives the message from the computer network 12 and acknowledges acceptance. A proximity application on the sender's computer equipment 14 or 48 then reviews all the responses from multiple devices 18 and estimates the distance that each device is from the target location. The nearest device 18 can then be dispatched as described in the dispatch application above.

Although the invention has been described with reference to the preferred embodiment illustrated in the attached drawing figures, it is noted that equivalents may be employed and substitutions made herein without departing from the scope of the invention as recited in the claims.

Having thus described the preferred embodiment of the invention, what is claimed as new and desired to be protected by Letters Patent includes the following:

CLAIMS:

1. A method of wirelessly delivering information comprising the steps of:  
receiving information from a sender that is destined for a recipient;  
conditioning the information so that it can be more easily delivered to the  
recipient;  
storing the information in a queue until a computing and communication device  
operated by the recipient is in communication with a wireless  
communication service provider; and  
provisioning the computing and communication device by pushing the information  
as well as all applications needed to act upon the information to the  
computing and communication device when the computing and  
communication device is in communication with the wireless  
communication service provider so that the recipient may continue to use  
the information even when the computing and communication device is no  
longer in communication with the wireless communication service provider.

2. The method as set forth in claim 1, the provisioning step further  
including the steps of:  
receiving from the computing and communication device an indication of what  
applications are needed to act upon the information; and  
pushing to the computer and communication device the applications.

3. The method as set forth in claim 1, the information including at least  
one of the following: dispatch information, calender information, search request, location  
information software, and software upgrades.

4. The method as set forth in claim 1, the computing and communication  
device including one of the following: a personal digital assistant, a personal computer,  
a laptop computer, and an intelligent wireless phone.

5. The method as set forth in claim 1, wherein the sender is a company  
wishing to deliver information to employees, suppliers, or customers.

6. The method as set forth in claim 5, wherein the recipient is an employee, supplier or customer of the company.

7. The method as set forth in claim 1, the provisioning step further including the step of automatically loading the information into appropriate software applications on the computing and communication device.

8. The method as set forth in claim 1, the conditioning step including the steps of:

10       creating a unique ID number for the information;  
          converting the information to transmittable strings of data; and  
          parsing the information into a series of message packets.

15       9. A computer system for wirelessly delivering information, the system being operable to:

20           receive information from a sender that is destined for a recipient;  
          condition the information so that it can be more easily delivered to the recipient;  
          store the information in a queue until a computing and communication device  
          operated by the recipient is in communication with a wireless  
          communication service provider; and

25           provision the computing and communication device by pushing the information  
          as well as all applications needed to act upon the information to the  
          computing and communication device when the computing and  
          communication device is in communication with the wireless  
          communication service provider so that the recipient may continue to use  
          the information even when the computing and communication device is no  
          longer in communication with the wireless communication service provider.

30       10. The system as set forth in claim 9, the system being further operable to:

          receive from the computing and communication device an indication of what  
          applications are needed to act upon the information; and  
          push to the computer and communication device the applications.



11. The system as set forth in claim 9, the information including at least one of the following: dispatch information, calender information, search request, location information software, and software upgrades.

5                   12. The system as set forth in claim 9, the computing and communication device including one of the following: a personal digital assistant, a personal computer, a laptop computer, and an intelligent wireless phone.

10                   13. The system as set forth in claim 9, wherein the sender is a company wishing to deliver information to employees, suppliers, or customers.

14. The system as set forth in claim 13, wherein the recipient is an employee, supplier or customer of the company.

15                   15. The system as set forth in claim 9, the system being further operable to automatically load the information into appropriate software applications on the computing and communication device.

20                   16. The system as set forth in claim 9, the system being further operable to:

create a unique ID number for the information;  
convert the information to transmittable strings of data; and  
parse the information into a series of message packets.

A method and system for pushing information to personal computing and communication devices operated by users in such a way that the users can use and/or act upon the information even when the users are off-network or off-line. The method and system also automatically "provisions" the personal computing and communication devices so that the devices may be used to act upon the information that is pushed to the devices.

FIG. 1.

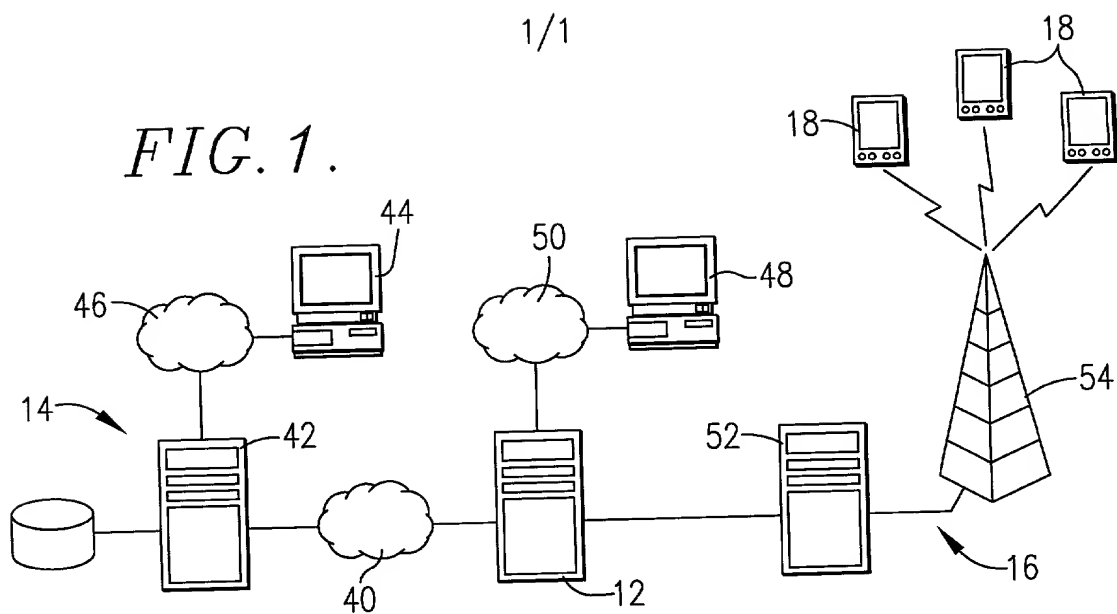
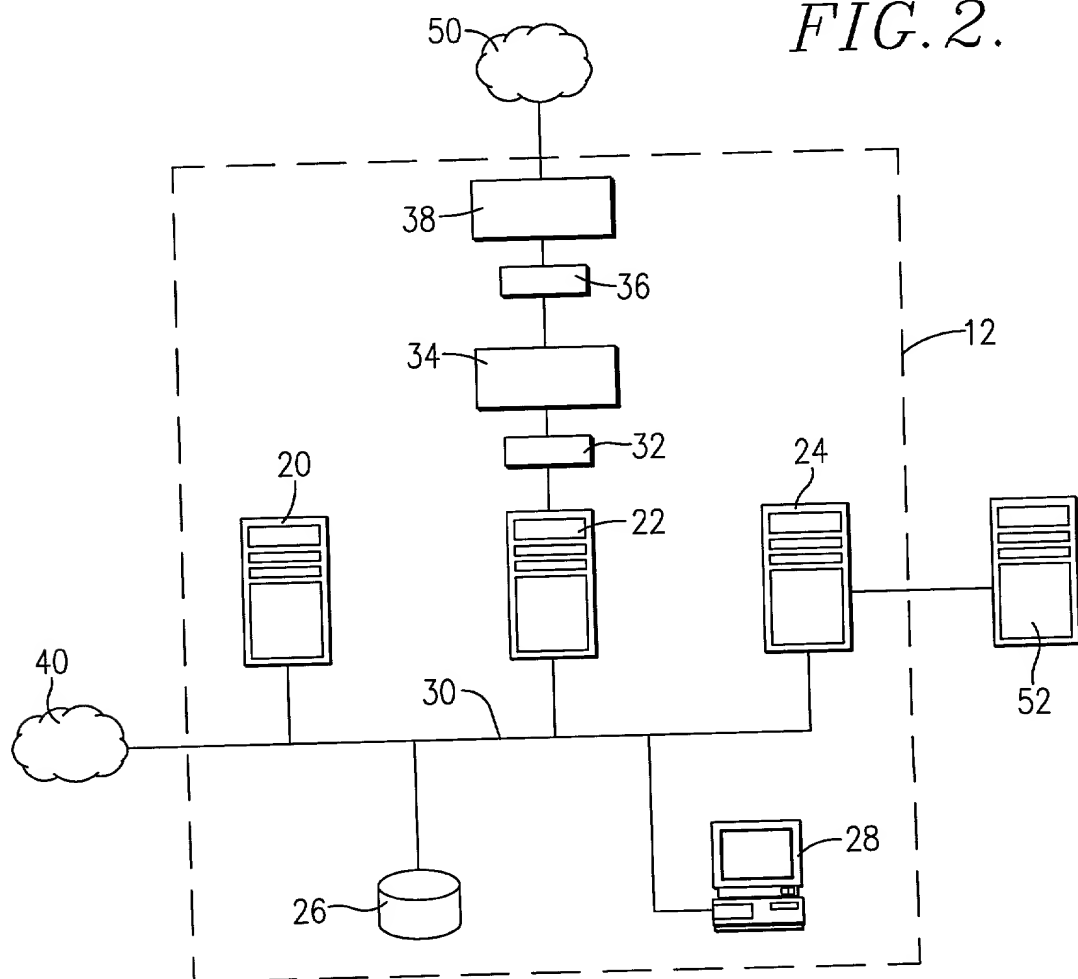


FIG. 2.



<b>COMBINED DECLARATION AND POWER OF ATTORNEY</b> (Original, Design, National Stage of PCT or CIP Application)	<b>ATTORNEY'S DOCKET NO.</b> 30875
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As a below named inventor I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHOD AND SYSTEM FOR DELIVERING WIRELESS MESSAGES AND INFORMATION TO  
PERSONAL COMPUTING DEVICES**

the specification of which: (complete (a), (b) or (c) for type of application)

**REGULAR OR DESIGN APPLICATION**

- (a) ☒ is attached hereto.  
 (b) ☐ was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

**PCT FILED APPLICATION ENTERING NATIONAL PHASE**

- (c) ☐ was described and claimed in International Application No. \_\_\_\_\_ filed \_\_\_\_\_  
 and as amended on \_\_\_\_\_ (if any).

**ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR**

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56(a).

- ☐ In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.97.

**PRIORITY CLAIM**

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: (complete (d) or (e))

- (d) ☒ no such applications have been filed.  
 (e) ☐ such applications have been filed as follows

EARLIEST FOREIGN APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS PRIOR TO SAID APPLICATION				
Country	Application No.	Date of Filing	Date of Issue	Priority Claimed
				<input type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO
				<input type="checkbox"/> YES <input type="checkbox"/> NO
ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS PRIOR TO SAID APPLICATION				

**PROVISIONAL**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States application(s) listed below:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)
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**CONTINUATION-IN-PART**

(Complete This Part Only If This Is A Continuation-In-Part Application)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56(a), which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application:

Application Serial No.	Filing Date	Status (patented, pending, abandoned)
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**POWER OF ATTORNEY**

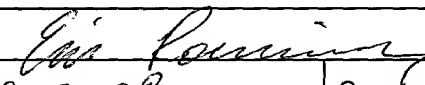
As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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Warren N. Williams	19,156	Andrew G. Colombo	40,565
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's Signature			
Date		Country of Citizenship	
Residence			
Post Office Address			